

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
30 October 2003 (30.10.2003)

PCT

(10) International Publication Number  
WO 03/090258 A2

(51) International Patent Classification<sup>7</sup>: H01L 21/00 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NL, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number: PCT/EP03/04069 (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(22) International Filing Date: 17 April 2003 (17.04.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
S2002/0289 19 April 2002 (19.04.2002) IE  
0225033.0 28 October 2002 (28.10.2002) GB

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## Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A2

WO 03/090258 A2

(54) Title: PROGRAM-CONTROLLED DICING OF A SUBSTRATE USING A PULSED LASER

(57) Abstract: A substrate (30) is diced using a program-controlled pulsed laser beam (35) apparatus having an associated memory for storing a laser cutting strategy file. The file contains selected combinations of pulse rate  $\Delta t$ , pulse energy density  $E$  and pulse spatial overlap to machine a single layer or different types of material in different layers (31, 32, 33, 34) of the substrate while restricting damage to the layers and maximising machining rate to produce die having predetermined die strength and yield. The file also contains data relating to the number of scans necessary using a selected combination to cut through a corresponding layer. The substrate is diced using the selected combinations. Gas handling equipment for inert or active gas may be provided for preventing or inducing chemical reactions at the substrate prior to, during or after dicing.